

GLM:tj 02/11/03 E-059-2000/0US-01
PATENTAttorney Reference Number 4239-54279
Application Number 09/595,580

The effectiveness of the nonlinear model in predicting gene expression can then be measured to quantify relatedness for genes in the set.

Finally, Applicants amended the claim to recite "presenting a plurality of the quantifications of gene relatedness showing relative relatedness for a plurality of the permutations of the genes."

For example, the Application shows example presentations at FIGS. 11 and 25. Further, the Application explains at page 12, line 27 - page 13, line 2:

For the model 704, a value of 0.74 is provided and quantifies the effectiveness of the model 704 and the relatedness of the genes G_1 , G_2 , and G_3 (and the condition C_1). In the example, a high value indicates more relatedness than a low value, and the value falls between 0 and 1. However, any number of other conventions can be used (e.g., a percentage or some other rating).

Claim 1 is thus supported by the specification.

Claim 50

Support for the "nonbinary" language is found, for example, at page 3, lines 15-17:

Another implementation uses a neural network-based multivariate nonlinear model. For example, a ternary perceptron can be constructed with predictive elements as inputs and a predicted expression level for a predicted gene as an output.

Support for the "the effectiveness indicating gene relatedness" is found, for example, at page 2, lines 8-10:

The effectiveness of the nonlinear model in predicting gene expression can then be measured to quantify relatedness for genes in the set.

Claim 50 is thus supported by the specification.

Claim 54

Support for "generate a quantification" and "present the quantification as indicating relatedness . . ." is found, for example, at FIGS. 11 and 25. Further, the Application explains at page 12, line 27 - page 13, line 2:

For the model 704, a value of 0.74 is provided and quantifies the effectiveness of the model 704 and the relatedness of the genes G_1 , G_2 , and G_3 (and the condition C_1). In the example, a high value indicates more relatedness than a low value, and the value falls between 0 and 1. However, any number of other conventions can be used (e.g., a percentage or some other rating).

Claim 54 is thus supported by the specification.

Claims 62 and 65

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Support for "relatedness within a network controlling gene expression" is found, for example, at page 6, lines 20-26:

Gene relatedness includes genes having any of a variety of relationships, including coexpressed genes, coregulated genes, and codetermined genes. The mechanism of the relationship need not be a factor in determining relatedness. In the network that controls gene expression, a gene may be upstream or downstream from others; some may be upstream while others are downstream; or they may be distributed about the network in such a way that their relationship is based on chains of interaction among various intermediate genes or other mechanisms.

Claim 63

Support for "relatedness based on chains of interaction among various mechanisms" is found, for example, at page 6, lines 20-26:

Gene relatedness includes genes having any of a variety of relationships, including coexpressed genes, coregulated genes, and codetermined genes. The mechanism of the relationship need not be a factor in determining relatedness. In the network that controls gene expression, a gene may be upstream or downstream from others; some may be upstream while others are downstream; or they may be distributed about the network in such a way that their relationship is based on chains of interaction among various intermediate genes or other mechanisms.

Claim 65

Support for the "permutations" language is found, for example at FIG. 8 and page 13, lines 7-16. For example page 13, lines 15-16 state:

At 820, if there are more possible permutations of predictive elements for the predicted gene, the method proceeds to 808.

Support for the "effectiveness being a quantification of gene relatedness" is found, for example, at page 2, lines 8-10:

The effectiveness of the nonlinear model in predicting gene expression can then be measured to quantify relatedness for genes in the set.

Finally, support "presenting at least one of the permutations of genes as related and a rating indicating gene relatedness for the permutation" is shown in the Application, for example, in the presentations at FIGS. 11 and 25. Further, the Application explains at page 12, line 27 - page 13, line 2:

For the model 704, a value of 0.74 is provided and quantifies the effectiveness of the model 704 and the relatedness of the genes G_1 , G_2 , and G_3 (and the condition C_1). In the example, a high value indicates more relatedness

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than a low value, and the value falls between 0 and 1. However, any number of other conventions can be used (e.g., a percentage or some other rating).

Claim 65 is thus supported by the specification.

Prior Art Rejections

Cited Art

The Action relies on Chen et al. "Ratio-Based Decisions and the Quantitative Analysis of cDNA Microarray Images," Journal of Biomedical Optics, 1997, vol. 2:364-373 ("Chen I"); Jain et al., IEEE Transactions on Pattern Analysis and Machine Intelligence, 2000, vol. 22:4-37 ("Jain"); and Chen et al., Proc. SPIE, 1999, vol. 3602:422-428 ("Chen II").

Jain Reference

After carefully reviewing the file history, Applicants note that the Jain reference was not cited in a Form 1449 and so assume it was discovered by the Examiner during an associated search. Accordingly, Applicants respectfully request the Examiner list it on an appropriate Form PTO-892 so that it appears on the face of any patent issuing from the Application.

Patentability of Claims 1-54 and 61-65 over Chen I, Chen II, and Jain under § 103

As understood by Applicants, the Action of September 16, 2002, fails to make out a prima facie case of obviousness for claim 1 or the other claims. Accordingly, Applicants believe the claims are allowable at this time.

Request For Interview

If any issues remain, the Examiner is formally requested to contact the undersigned attorney in order to arrange a telephonic interview. It is believed that a brief discussion of the merits of the present application may expedite prosecution. Applicants submit the foregoing formal reply so that the Examiner may fully evaluate Applicants' position, thereby enabling the interview to be more focused.

This request is being submitted under MPEP § 713.01, which indicates that an interview may be arranged in advance by a written request.

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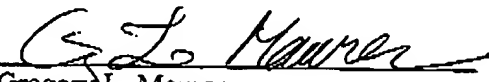
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Conclusion

The claims in their present form should now be allowable. Such action is respectfully requested.

Respectfully submitted,

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